

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions of claims in the application.

1. (Currently Amended) Ink comprising:

a primary particle of a copolymer that has a glass transition point less than or equal to 65°C, a softening point measured by a flow tester ranging from 40 through 150°C and a volume average particle diameter ranging from 0.05 through 1 μm obtained from a radical polymeric monomer composition consisting essentially of:

(a) 20 through 99 wt% of styrene;

(b) 10 through 80 wt% of ~~alkyl acrylate, acrylate or alkyl methacrylate~~, substituted or unsubstituted alkyl acrylate or substituted or unsubstituted alkyl metacrylate, wherein substituents are at least one selected from the group consisting of hydroxyl, amino, and ammonium substituents; and

(c) 5 through 10 wt% of the polymeric monomer including a polar group selected from the group consisting of acrylic acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride;

a colorant, and

a solvent that is liquid at room temperature;

wherein said colorant is

dissolved or dispersed in said copolymer particles or

dispersed in said solvent with said copolymer particles by absorption adsorption on or coating a surface of said copolymer particles,

but said colorant is not dissolved in said solvent; and

wherein the primary particle of the copolymer is prepared by a polymerization process selected from the group consisting of an emulsion polymerization, a micro emulsion polymerization and a soap-free polymerization.

2-3. (Canceled)

4. (Previously Presented) The ink according to claim 1, wherein said copolymer has a glass transition point ranging from -30 through 65°C.

5. (Canceled)

6. (Original) The ink according to claim 1, wherein said colorant comprises one selected from the group consisting of a pigment and a dye, and said colorant is dissolved or dispersed in said primary particle of a copolymer.

7. (Currently Amended) The ink according to claim 1, wherein said colorant comprises one selected from the group consisting of a pigment and a dye, ~~and said colorant is absorbed on or coats a surface of said copolymer.~~

8. (Canceled)

9. (Original) The ink according to claim 1, wherein said copolymer is included at 1 through 50 wt%.

10. (Original) The ink according to claim 1, wherein said colorant is included at 0.1 through 20 wt%.

11-13. (Canceled)

14. (Currently Amended) Ink comprising:

a copolymer particle that has a glass transition point less than or equal to 65°C, a softening point measured by a flow tester ranging from 40 through 150°C and a volume average particle diameter ranging from 0.05 through 1 μ m obtained from a radical polymeric monomer composition consisting essentially of:

(a) 20 through 99 wt% of styrene;

(b) 10 through 80 wt% of ~~alkyl acrylate, alkyl methacrylate, substituted or unsubstituted alkyl acrylate or substituted or unsubstituted alkyl metacrylate, wherein substituents are at least one selected from the group consisting of hydroxyl, amino, and ammonium substituents; and~~

(c) 5 through 10 wt% of the polymeric monomer including a polar group selected from the group consisting of acrylic acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride;

a colorant; and

a solvent that is liquid at room temperature;

wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in said solvent with said copolymer particles by ~~absorption adsorption~~ on or coating a surface of said copolymer particles, but said colorant is not dissolved in said solvent; and

wherein the primary particle of the copolymer is prepared by a polymerization process selected from the group consisting of an emulsion polymerization, a micro emulsion polymerization and a soap-free polymerization.

15. (Original) The ink according to claim 14, further comprising a surfactant covering a surface of said copolymer particle.

16. (Currently Amended) An ink cartridge including a case and ink which is stored in said case and comprises:

a copolymer particle that has a glass transition point less than or equal to 65 °C, a softening point measured by a flow tester ranging from 40 through 150 °C and a volume average particle diameter ranging from 0.05 through 1 μm obtained from a radical polymeric monomer composition consisting essentially of:

(a) 20 through 99 wt% of styrene; and

(b) 10 through 80 wt% of alkyl acrylate, alkyl methacrylate, substituted or unsubstituted alkyl acrylate or substituted or unsubstituted alkyl metacrylate, wherein substituents are at least one selected from the group consisting of hydroxyl, amino, and ammonium substituents; and

(c) 5 through 10 wt% of the polymeric monomer including a polar group selected from the group consisting of acrylic acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride;

a colorant; and

a solvent that is liquid at room temperature;

wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in said solvent with said copolymer particles by absorption adsorption on or coating a surface of said copolymer particles, but said colorant is not dissolved in said solvent; and

wherein the primary particle of the copolymer is prepared by a polymerization process selected from the group consisting of an emulsion polymerization, a micro emulsion polymerization and a soap-free polymerization.

17. (Currently Amended) A recording device including a head and an ink cartridge supplying ink to said head, wherein said ink comprises:

a copolymer particle that has a glass transition point less than or equal to 65 °C, a softening point measured by a flow tester ranging from 40 through 150 °C and a volume average particle diameter ranging from 0.05 through 1 μm obtained from a radical polymeric monomer composition consisting essentially of:

(a) 20 through 99 wt% of styrene;

(b) 10 through 80 wt% of alkyl acrylate, alkyl methacrylate, substituted or unsubstituted alkyl acrylate or substituted or unsubstituted alkyl metacrylate, wherein substituents are at least one selected from the group consisting of hydroxyl, amino, and ammonium substituents; and

(c) 5 through 10 wt% of the polymeric monomer including a polar group selected from the group consisting of acrylic acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride;

a colorant; and

a solvent that is liquid at room temperature;

wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in said solvent with said copolymer particles by ~~absorption~~ adsorption on or coating a surface of said copolymer particles, but said colorant is not dissolved in said solvent; and

wherein the primary particle of the copolymer is prepared by a polymerization process selected from the group consisting of an emulsion polymerization, a micro emulsion polymerization and a soap-free polymerization.

18-19. (Canceled)

20. (Currently Amended) Ink comprising:

a primary particle of a copolymer that has a glass transition point -30 through 65 °C, a softening point measured by a flow tester ranging from 40 through 150 °C and a volume average particle diameter ranging from 0.05 through 1 μm obtained from a radical polymeric monomer composition consisting essentially of:

(a) 20 through 99 wt% of styrene;

(b) 10 through 80 wt% of alkyl acrylate, or alkyl methacrylate; and

(c) 5 through 10 wt% of the polymeric monomer including a polar group selected from the group consisting of acrylic acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride; a colorant; and

a solvent that is liquid at room temperature;

wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in said solvent with said copolymer particles by ~~absorption~~ adsorption on or coating a surface of said copolymer particles, but said colorant is not dissolved in said solvent; and

wherein the primary particle of the copolymer is prepared by a polymerization process selected from the group consisting of an emulsion polymerization, a micro emulsion polymerization and a soap-free polymerization.

21. (Currently Amended) The ink of claim 1, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, ~~vinylpyridine~~ and N, N-diallylmethylammonium chloride.

22. (Currently Amended) The ink of claim 14, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, ~~vinylpyridine~~ and N, N-diallylmethylammonium chloride.

23. (Currently Amended) The ink of claim 16, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, ~~vinylpyridine~~ and N, N-diallylmethylammonium chloride.

24. (Currently Amended) The ink of claim 17, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, ~~vinylpyridine~~ and N, N-diallylmethylammonium chloride.

25. (Currently Amended) The ink of claim 20, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, ~~vinylpyridine~~ and N, N-diallylmethylammonium chloride.